Memoires de l'Academie Imperiale des Sciences de St. Petersburg. 8th Series. Vol. III. No. 1.

The publications of the Jesuit Observatory at Zi-ka-wei.

Doberck, in the reports of the observatory at Hongkong.

No. 3—Law of Storms in the Eastern Seas. Hongkong. 1898 and 1904.

TABLE 8.—Comparative temperatures.

MONTHLY MEANS.

The last station in each United States group represents the one approaching the foreign station most closely.

Latitudes and stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
	°	°	°	°	°	°	°	°	°	°	°	°	°
Latitude 41° 46' N.:													
Hakodate, Japan	27	28	34	43	50	58	67	70	64	52	41	32	47
Same latitude in United States.													
Storrs, Conn.	24	24	36	46	56	64	69	68	61	50	38	30	47
Wauseon, Ohio	23	26	33	47	59	69	73	70	63	50	36	28	48
Newton, Iowa	20	20	35	50	62	70	75	72	64	53	36	22	48
Amherst, Mass.	24	25	34	46	57	66	70	68	62	50	38	27	47
Latitude 38° 14' N.:													
Yamagata, Japan	27	27	35	47	57	65	72	74	67	54	42	33	50
Same latitude in United States:													
Staunton, Va.	34	34	45	53	64	71	75	74	68	57	46	37	55
Louisville, Ky.	35	37	45	56	67	75	79	77	70	59	46	38	57
[1] Dover, N. J.	27	27	35	47	59	67	72	70	63	51	41	31	49
Latitude 35° 41' N.:													
Tokyo, Japan	37	38	45	54	62	69	76	78	72	60	50	42	57
Same latitude in United States:													
Hatteras, N. C.	45	46	51	57	67	74	78	78	74	65	56	48	62
Goldsboro, N. C.	42	46	52	60	70	77	80	78	73	62	52	44	61
Santa Barbara, Cal.	53	55	55	58	60	63	65	67	66	63	59	56	60
[2] Solomons, Md.	35	35	44	53	65	74	79	78	72	60	49	39	57
Latitude 31° 35' N.:													
Kagoshima, Japan	43	44	51	60	65	71	78	79	75	66	55	47	61
Same latitude in United states:													
Poulan, Ga.	48	51	59	64	73	79	81	81	76	66	57	50	65
Evergreen, Ala.	48	51	58	65	72	78	81	80	76	65	56	50	65
Alexandria, La.	49	50	59	67	74	79	82	82	76	66	57	50	66
[3] Fayetteville, N. C.	43	44	54	60	70	76	79	78	72	62	51	43	61
[4] Visalia, Cal.	44	49	52	58	66	74	80	79	71	63	52	45	61
Latitude 43° 9' N.:													
Vladivostock, Russia	−10	−4	9	27	39	54	62	61	51	35	14	−5	28
Same latitude in United States:													
Plymouth, N. H.	16	18	26	42	54	64	68	66	58	46	34	22	43
Port Huron, Mich.	22	23	30	43	54	64	69	65	62	50	37	27	46
Rosebud, N. Dak.	21	20	31	46	58	67	74	72	62	49	33	24	46
Bandon, Oreg.	45	45	47	50	53	57	58	58	56	52	49	47	51
[5] Morris, Minn.	8	10	24	45	56	66	71	68	60	46	26	15	41
Latitude 39° 57' N.:													
Peking, China	24	30	41	57	68	76	79	76	68	54	39	28	53
Same lat itude in United States:													
Philadelphia, Pa.	32	34	40	51	62	72	76	74	68	57	45	36	54
Oregon, Mo.	23	28	38	53	64	72	75	75	67	55	40	28	52
Denver, Colo.	29	32	39	48	57	67	72	71	63	51	39	33	50
[6] Concordia, Kans.	26	28	39	55	63	73	78	76	68	56	41	32	53
Latitude 32° 22' N.:													
Ho k'ien, China	34	39	49	60	69	78	82	81	72	62	49	38	59
Same latitude in United States:													
Dudley, Ga.	47	48	59	65	75	81	82	82	77	66	57	48	66
Montgomery, Ala.	48	51	58	65	74	80	82	81	76	66	56	49	66
Abilene, Tex.	44	46	55	65	72	79	82	82	75	66	54	47	64
[7] Oklahoma, Okla.	37	37	49	61	68	76	80	80	73	62	49	40	59
Latitude 30° 52' N.:													
I-chang, China	42	43	52	64	72	80	84	86	76	66	56	46	64
Nearest latitudes in U. S.: [8]													
Fredericksburg, Tex.	49	51	58	66	72	78	81	80	75	66	55	50	65
Tallahassee, Fla.	52	55	60	67	75	79	80	80	77	68	59	53	67
Melville, La.	51	53	61	68	75	79	82	81	77	67	59	52	67

[1] Latitude 40° 50' N.
[2] Latitude 38° 19' N.
[3] Latitude 35° 6' N.⎱ Both stations resemble
[4] Latitude 36° 20' N.⎰ Kagoshima.
[5] Latitude 45° 30' N.
[6] Latitude 39° 35' N.
[7] Latitude 35° 26' N.
[8] No station in United States corresponds closely with I-chang.

TABLE 9.—Comparative lowest minimum temperatures.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
	°	°	°	°	°	°	°	°	°	°	°	°	°
Hakodate, Japan													−7
Storrs, Conn.	−13	−13	2	15	25	39	45	42	32	20	5	−9	−13
Wauseon, Ohio	−32	−24	−17	5	21	34	41	38	25	12	−8	−32	−32
Newton, Iowa	−27	−28	−6	15	28	41	50	43	22	15	−8	−22	−28
Amherst, Mass.	−22	−19	−6	16	24	34	40	37	28	20	4	−15	−22
Yamagata, Japan													15
Staunton, Va	−13	−12	4	19	31	41	48	47	32	20	10	−3	−13
Louisville, Ky	−20	−14	3	21	33	44	54	50	36	26	4	−7	−20
Dover, N. J	−13	−10	−4	14	28	40	43	40	30	19	8	−6	−13
Tokyo, Japan													15
Hatteras, N. C	14	11	25	31	43	56	61	60	50	42	27	8	8
Goldsboro, N. C	12	11	17	30	36	46	50	53	41	31	17	9	9
Santa Barbara, Cal	28	29	34	38	40	46	48	52	49	47	40	32	28
Solomons, Md	4	−5	15	28	41	52	57	58	46	35	20	10	−5

TABLE 9.— Comparative lowest minimum temperatures— Cont'd.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
	°	°	°	°	°	°	°	°	°	°	°	°	°
Kagoshima, Japan													21
Poulan, Ga.	10	−1	19	27	41	49	56	58	40	32	21	11	−1
Evergreen, Ala	13	0	23	30	42	54	59	59	40	30	22	13	0
Alexandria, La	17	2	20	29	40	45	51	48	40	28	19	10	2
Fayetteville, N. C.	10	−5	15	29	42	51	54	51	39	30	16	9	−5
Visalia, Cal.	17	21	22	30	35	38	45	49	37	31	23	19	17
Peking, China	−2	−4	12	26	39	47	62	58	43	28	8	3	−4
Philadelphia, Pa.	−5	−6	5	18	36	47	54	51	40	31	8	−5	−6
Oregon, Mo.	−30	−26	−12	8	26	41	47	37	25	8	−10	−24	−30
Denver, Colo.	−29	−22	−11	4	27	36	42	43	27	1	−18	−25	−29
Concordia, Kans	−25	−25	−2	18	27	43	46	41	29	20	−15	−10	−25
I-chang, China	20	22	28	39	43	60	60	67	58	45	33	26	20
Tallahassee, Fla.	19	−2	25	38	45	54	57	61	52	35	27	12	−2
Melville, La.	16	5	25	38	45	51	61	54	42	32	21	10	5
Fredericksburg, Tex.	11	−1	19	32	38	48	59	57	43	28	24	11	−1

TABLE 10.—Mean number of days with minimum temperature below 32° F.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Sapporo	31.0	27.8	27.3	13.7	2.7					5.0	18.5	28.5	154.5
Hakodate	29.9	25.5	23.4	8.4	0.9					1.7	13.4	25.8	129.0
Akita	30.0	27.0	24.0	3.0							7.0	23.0	114.0
Yamagata	30.0	26.0	17.5	4.5						0.3	10.3	22.7	111.3
Matsumoto	30	27	23	7	1					1	15	26	130
Tokyo	25.6	19.2	9.5	0.6						0.1	1.4	15.9	72.3
Gifu	24.4	20.8	11.8	0.7							2.3	12.0	71.5
Wakayama	13.8	11.5	4.4	0.2						0.1	4.2	34.2	
Hiroshima	18.8	13.8	6.8	0.2						0.8	8.2	41.0	
Kagoshima	9.4	7.2	1.2								0.1	3.6	21.5

Mean number of days with maximum temperatures above 86° F.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Sapporo						0.2	3.2	5.7	0.3				9.4
Hakodate							0.8	1.9	0.1				2.8
Akita							2.0	5.0	11.0	2.0			20.0
Yamagata						1.0	2.5	5.3	10.7	3.0			22.5
Matsumoto (77° or above)				1	7	13	22	28	15	1			85
Tokyo						0.7	9.9	16.0	4.2				30.8
Gifu					0.6	2.3	15.7	24.3	7.6				50.5
Wakayama					0.1	0.9	15.6	35.2	8.5				33.4
Hiroshima						0.4	15.2	24.7	7.8				48.1
Kagoshima						2.0	20.0	24.0	11.2	0.1			57.4

Extreme dates of first and last occurrence of minimum temperatures below 32° F.

Stations.	First date.	Last date.	Stations.	First date.	Last date.
Sapporo	Oct. 8	May 20	Gifu	Nov. 12	Apr. 10
Hakodate	Oct. 11	May 28	Wakayama	Nov. 30	Apr. 4
Akita	Oct. 26	Apr. 30	Hiroshima	Nov. 13	Apr. 3
Yamagata	Oct. 31	Apr. 27	Kagoshima	Nov. 29	Mar. 28
Tokyo	Oct. 31	Apr. 15			

TABLE 11.—Mean dates of the occurrence of a minimum temperature of 32° F. in Japan.

Stations.	First date.	Last date.	Stations.	First date.	Last date.
Yezzo.			*Hondo.—Cont'd.*		
Sapporo	Oct. 18	May 7	Tokyo	Nov. 28	Mar. 27
Hakodate	Oct. 26	Apr. 30	Gifu	Nov. 27	Mar. 30
Hondo.			Wakayama	Dec. 17	Mar. 23
Akita	Nov. 7	Apr. 14	Kagoshima	Dec. 15	Mar. 8
Yamagata	Nov. 6	Apr. 12			

NOTES FROM THE WEATHER BUREAU LIBRARY.

By C. Fitzhugh Talman, Librarian.

A PILOT-BALLOON STATION AT AACHEN.

It is announced in Illustrierte Aeronautische Mitteilungen that a pilot-balloon station has been established at Aachen (Aix-la-Chapelle) in connection with the meteorological observatory and Public Weather Service center at that place, of which Dr. P. Polis is director. The new institution is maintained at the expense of the German Empire, and has been in

regular operation since the middle of September, making daily ascents whenever the air was clear enough to enable the movements of the balloon to be followed with the Quervain theodolite. The information thus obtained regarding the direction and velocity of the upper air currents is published on the Aachen daily weather map. It has been found possible to follow the flight of the balloons to a distance of 12 kilometers and to an altitude of 8,000 meters.

GOCKEL'S "DIE LUFTELEKTRIZITAET."[1]

A comprehensive survey of modern ideas regarding atmospheric electricity—a branch of physics that has been revolutionized during the past decade—has been badly needed; and such a work has now been published by Dr. Albert Gockel, professor of physics at the University of Freiburg, Switzerland. In five chapters the author discusses (1) the electrical conductivity of the atmosphere, (2) the electrical field of the earth, (3) electrical currents in the atmosphere, (4) the earth current, and (5) factors producing the ionisation of the atmosphere.

An extended review of this work, by E. Lagrange, appears in Ciel et Terre of November 16, 1908, and another, by Prof. W. J. Humphreys, of the United States Weather Bureau, is to be published shortly in the Astrophysical Journal.

METEOROLOGY AT THE NINTH INTERNATIONAL GEOGRAPHICAL CONGRESS.

The Ninth International Geographical Congress was held at Geneva from July 27 to August 9. One of the sections was devoted to meteorology, climatology, and terrestrial magnetism, the president-of this section being Professor Hellmann, of Berlin, and the secretary, Dr. Alfred de Quervain, Zürich. Various reports were presented to the section, and M. Maurer, the director of the Central Meteorological Institute of Zürich, exhibited a new rainfall map of Switzerland, which completed that of the late M. Bilwiller published in 1893. A report was also presented on the work published by the Geographical Society of Portugal, entitled "Elements of Nautical Meteorology." Professor Hellmann described a new method of determining the average rainfall of a district, and Dr. Polis of Aix-la-Chapelle spoke of weather forecasting and the use of wireless telegrams. Professor Kassner described the uses of his meteorological globes, and Professor Gautier read a paper on the climatology of the Grand St. Bernard.—*Quarterly Journal of the Royal Meteorological Society, October, 1908.*

SCIENTIFIC MEETINGS AT THE BRITISH METEOROLOGICAL OFFICE.

Meetings for the discussion of important contributions to meteorological literature, principally those of colonial or foreign meteorologists, are held at the British Meteorological Office, 63 Victoria street, London, on alternate Monday afternoons from October to March, inclusive, at 5 o'clock. Attendance is not limited to the staff of the office; outsiders interested in meteorology are welcome, and are allowed to take part in the discussions. The meetings for this year opened October 19, with an account of the work of the meteorological service of Australia, by its chief, Mr. H. A. Hunt, and a discussion of the rainfall of the Transvaal, by the director of the meteorological service of that colony, Mr. R. T. A. Innes.

METEOROLOGICAL BREAKFAST AT THE BRITISH ASSOCIATION, DUBLIN, 1908.

The annual meteorological breakfast, founded by Mr. Symons and revived in 1901, took place [this year] in exceptionally favorable surroundings. Thanks to the initiative of Sir John Moore, the leading meteorologist in Ireland, the Royal College of Physicians of Ireland placed their fine hall at the disposal of the meteorologists and rainfall observers present at the meeting, and no less than forty-eight sat down to breakfast at 9 a. m. on Tuesday, 8th September. Sir John Moore presided. Sir John Moore said a few words of welcome to the

meteorologists visiting Dublin, and thanked the president of the Royal College of Physicians of Ireland for the kindness of the college in granting the use of their hall for the occasion. He congratulated Section A [the physical section of the British Association] on having as its president Dr. Shaw [director of the British Meteorological Office] who combined the highest mathematical powers with profound meteorological knowledge, and referred to the foreign and imperial meteorologists who were present. Appropriate replies were made by M. Teisserenc de Bort, who spoke in French and was very heartily received; Prof. A. Lawrence Rotch, of Harvard University; Dr. W. N. Shaw, president of Section A; Dr. Gilbert Walker, the head of the meteorological service in India, and Captain Lyons, director of surveys in Egypt.—*Symons's Meteorological Magazine, September, 1908.*

INTERNATIONAL KITE AND BALLOON ASCENTS IN 1909.

Professor Hergesell, of Strassburg, president of the International Committee on Scientific Aeronautics, has notified the institutions taking part in the international upper-air investigations that the following dates have been chosen for kite and balloon ascents during 1909: January 11, 12, and 13 (small series); February 4; March 4; March 31, and April 1 and 2 (small series); May 6; June 3; June 30, and July 1 and 2 (small series); August 5; September 2; October 6, 7, and 8 (small series); November 4; December (great series, dates not yet decided).

In previous years the "great series" or "international week" of simultaneous upper-air observations all over the world has been carried out in summer; in the series held last summer special attention was paid to the exploration of the air over the intertropical regions. The selection of a winter month for the next "international week" was the result of suggestions made at the jubilee meeting of the German Meteorological Society in Hamburg last September.

WEATHER FOLK-LORE OF THE TYROL.

Quaint superstitions and customs relating to the weather that prevail among European peasants, especially in the Tyrol, form the subject of a highly readable article by Mrs. Herbert Vivian in the November number of the Wide World Magazine. There are several photographic illustrations, showing such objects as the "storm crucifix," the "hail cross," the "storm candle," potent to drive away hail-storms, a talisman that protects its wearer against lightning and tempest, and an ancient "letter of protection" that insures safety from a multitude of ills, including all the baneful influences of the atmosphere.

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AN ELEMENTARY METHOD OF DERIVING THE DEFLECTING FORCE DUE TO THE EARTH'S ROTATION FOR WEST-EAST MOTION.

By Prof. W. H. JACKSON. Dated Haverford College, Pa., October 22, 1908.

The shape of the earth is not spherical but deviates from that shape in such a way that the surface is everywhere normal to the *apparent* direction of gravitation.

To find how air moving freely over the surface would be deflected relatively to the circles of latitude, it is sufficient to find what would be the difference between the accelerations of a point moving with uniform velocity v in a small circle and a point at rest relatively to the earth.

Let P be any point on the earth's surface, and let E be its projection on the earth's axis of rotation.

This difference is seen from fig. 1 to be—

$$EP \cdot \left(\omega + \frac{v}{EP}\right)^2 - EP \cdot \omega^2 = 2\omega v + \frac{v^2}{EP}.$$

If we neglect v in comparison with $\omega \cdot EP$, the velocity of P due to the earth's rotation, this is simply $2\omega v$; its direction is along PE. Resolving along the earth's surface, we obtain the

[1] Gockel, Albert. Die Luftelektrizität. Methoden und Resultate der neueren Forschung. Leipzig: S. Hirzel. 1908.